

Guidance on evaluation of innovation

Economic Indicators, Monitoring, and Evaluation Tools for Smart Specialisation Strategies (RIS3)

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Wider context

- The study “**Evaluation of Innovation Activities: Guidance on methods and practices**” funded by the EC Directorate for Regional Policy is the primary source of information, complemented by additional examples from the **Regional Innovation Monitor** and the recent **work on assessing the RIS3 in Poland**.
- In the context of **budgetary restraints**, it is of the utmost importance to understand what worked well and what didn't in order to guarantee the highest return of public R&DI investment.
- Despite significant (€83.7bn) ERDF investment, **the effects are not sufficiently evaluated**.
- Taking into account **the planned concentration of ERDF investment** during the 2014-2020 programming perspective (e.g. 44% for research, innovation, and competitiveness of SMEs in less developed regions and 60% in more developed and transition regions), demonstrating the impacts will be more important than ever before.

In a nutshell...

| Type of innovation measure | Mode and target | Evaluation case studies |
|---|--|---|
| Science-industry co-operation networks and platforms | Funding allocated to consortia or joint projects involving enterprises and research or higher education institutes | <ul style="list-style-type: none"> Danish Innovation Consortium Scheme |
| Strategic research programmes and research centres or infrastructures | Funding channelled to research institutions to conduct basic or applied research. | <ul style="list-style-type: none"> Austrian Genome Research Programme (GEN-AU) Irish SFI Centres for Science, Engineering and Technology (CSETs) and Principal Investigator (PI) programmes |
| Services (advisory, innovation management technology transfer and training) to innovative firms | Funding of incubators, business innovation centres, business support networks, etc. | <ul style="list-style-type: none"> Swedish National Incubator Programme West of Scotland Science Park |
| Funding of innovative companies | Funding to businesses via grants, subsidised loans or guarantee mechanisms Provision of debt finance (loans, loan guarantee) or equity finance via venture capital funds and business angels for young innovative firms/start-ups | <ul style="list-style-type: none"> Estonian Enterprise Policy 2007-13 Flanders IWT R&D grants Dutch Innovation Voucher |
| Cluster policies | Funding to cluster managers and/or groups of companies | <ul style="list-style-type: none"> Danish Innovation Consortium Scheme Finnish Programmes for Centres of Excellence in Research |

- The study took a more in-depth look at the following five common forms of intervention (this presentation will focus on three of them).
- The study covers 15 case studies on evaluations in 14 Member States.
- On this basis, guidance for managing authorities to support their evaluation activities was prepared.
- All the materials are available at: http://ec.europa.eu/regional_policy/information/evaluations/index_en.cfm#2

Key observations

- **Innovation policies seek to motivate different stakeholders.** Consequently, the measurable outcome of public intervention is more than just new sales of an innovative product and therefore it is important to analyse and assess changes in the national/regional innovation systems.
 - **Innovation is difficult to quantify** (e.g. how much of the change is due to the policy support measures) and often long time lags before an impact can be measure. Separating the effect of an intervention from other factors requires a **triangulation of evidence** through a mix of evaluation methods.
 - With regard to types of innovation measures, it has to be noted that the **indicators and the methods** used to evaluate different measures will necessarily differ.
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Key observations

- There is a need for **greater transparency, more open publications**, as well as further improvements in the format and presentation of many of the evaluation reports.
- Analysis of the **coherence** of innovation measures and **macro or system wide effects** remains rare.
- The uptake of **international comparisons** is limited due to the difficulty to find programmes with a matching design, operations and inputs.
- Over time, **the evolving focus of evaluations** from economic to behaviour additionality can be observed in some countries.

Evaluating science-industry cooperation

Key messages:

- *the importance of covering three main types of impacts, notably concrete R&D outputs, changes to collaborative practices, and improvements in R&D management.*
- *the need to conduct several rounds of analysis to capture short and longer-term results as well as establish a clear rationale for the selection of comparator programmes.*
- *the existence of a trade-off between the sophistication of methods and usability.*

| Indicative evaluation questions | Examples of possible indicators |
|---|---|
| <ul style="list-style-type: none"> ▪ Is there an overall level of increased research and innovation investment due to the collaboration? | <ul style="list-style-type: none"> ▪ Additional euro spent on R&D due to the funded project by firms involved in collaboration |
| <ul style="list-style-type: none"> ▪ Did the collaboration projects funded lead to high quality research results? | <ul style="list-style-type: none"> ▪ Number of (co-)publications in peer reviewed journals and citation impact |
| <ul style="list-style-type: none"> ▪ Did the collaboration result in increased innovation outputs? | <ul style="list-style-type: none"> ▪ Number of patents, prototypes, new products/services compared to a pre-project baseline for the partners |
| <ul style="list-style-type: none"> ▪ Did the projects lead to a sustained change in the type and frequency of science-industry collaboration? | <ul style="list-style-type: none"> ▪ Number and type (bilateral, consortium, etc.) of collaborations before, during and after intervention ▪ Increased personnel mobility between research institutes and firms, etc. |
| <ul style="list-style-type: none"> ▪ Did the interaction with industrial partners change the R&D management practices or orientation of research institutions? | <ul style="list-style-type: none"> ▪ Share of applied research in total activity of research institution ▪ Increased revenue knowledge transfer (licensing, etc.) |
| <ul style="list-style-type: none"> ▪ Did the projects enhance the innovation management capacities of businesses? | <ul style="list-style-type: none"> ▪ Number of newly adopted innovation management practices, changed business models, change in recruitment patterns. |
| <ul style="list-style-type: none"> ▪ Is there an observable economic impact in terms of new products or services? | <ul style="list-style-type: none"> ▪ Share of turnover based on innovations arising from collaborative projects. |

Evaluating strategic research and technology measures

| Indicative evaluation questions | Examples of possible indicators |
|--|--|
| <ul style="list-style-type: none"> Is the research funded relevant to the socio-economic needs of the region (country)? Have the investments been made in fields where the region is, or has potential to be, specialised? | <ul style="list-style-type: none"> Share of funding provided by industrial partners Active stakeholder involvement in user groups (number, functions of participants, etc.) Share of funding allocated per scientific/technological field compared to current scientific specialisation profile |
| <ul style="list-style-type: none"> Has the programme resulted in a sustainable improvement in research infrastructure? | <ul style="list-style-type: none"> % of potential running time for which installed equipment is used Share of time equipment is used by researchers from other institutions (open access) and revenue generated from this usage |
| <ul style="list-style-type: none"> Have the projects resulted in high quality scientific or technological results relevant to regional stakeholders? | <ul style="list-style-type: none"> Number of (co-)publications in peer reviewed journal and citation impact; Share of research results exploited in follow-on projects with industry and other user groups |
| <ul style="list-style-type: none"> Has the measure increased scientific and technological skills and specialisation in the region? | <ul style="list-style-type: none"> Number of new Master/PhD graduates in the priority fields; % of new graduates employed in regional businesses or research institutes Share of scientific and technological personnel trained in priority technology fields |
| <ul style="list-style-type: none"> Have the research results led to economic, social or environmental benefits in the region? | <ul style="list-style-type: none"> Increase in licensing revenue of research institutions or new technology based firms created using research results; New (foreign) investment in the region, e.g. business R&D facilities attracted by increased R&D capacity. Innovations with demonstrated environmental impact (e.g. reduced material or energy input). |

Key messages:

- Scoping of the evaluation: examine the impact on individual researchers, or on research groups or institutions/ changes in the publishing behaviour, longer-term behaviour, broader research community, or on the economic impact (on whom and what)?
- The economic outputs of strategic research are hard to measure, thus it is rarely examined.

Evaluating support services to innovative firms

Key messages:

- *It can take 10 years for even the most successful parks to become financially self-sustainable.*
- *A number of questions may be used to judge the value-for-money of a science park, e.g. the volume and rate of growth of the tenants or a return of investment compared with the rental income and taxes from the net additional growth in the economy.*
- *An evaluation must test the extent to which a science park is doing something additional for the area.*

| Indicative evaluation questions | Examples of possible indicators |
|---|--|
| <ul style="list-style-type: none"> ▪ Is there evidence of a market failure? | <ul style="list-style-type: none"> ▪ Companies reporting difficulties in renting equipped laboratories, etc. (industrial property surveys) ▪ Cost of park services compared to private market rates |
| <ul style="list-style-type: none"> ▪ Has the park attracted and retained tenants by providing quality infrastructure and services? | <ul style="list-style-type: none"> ▪ Profile of science park residents: R&D intensity, share of scientists and engineers in workforce, geographic origin of companies, etc. ▪ Rate of occupancy of facilities over time ▪ Rate of satisfaction of tenants (annual surveys) |
| <ul style="list-style-type: none"> ▪ Has the park leveraged sufficient funds to be financially sustainable? | <ul style="list-style-type: none"> ▪ Additional public or private (e.g. equity) investment secured by park residents |
| <ul style="list-style-type: none"> ▪ Has the park had a wider impact on the regional economy and innovation system? | <ul style="list-style-type: none"> ▪ Intensity of co-operation between park residents and university or public research teams (compared to regional average) ▪ Rate of growth of employment and value added of tenants (compared to regional average for similar firms) ▪ Number of spin-offs 'graduating' from incubators hosted in the science park |

Lessons drawn from specific case studies

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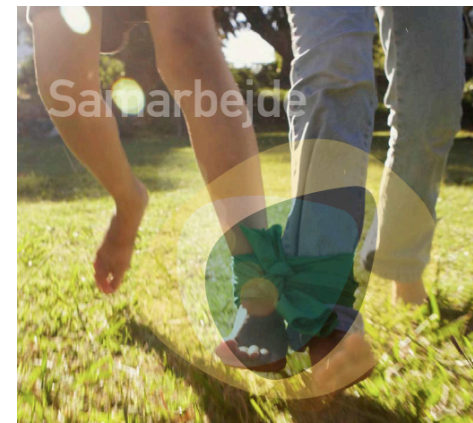
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An Analysis of Firm Growth Effects of the Danish Innovation Consortium Scheme
Innovation: Analyse og evaluering 3/2010



Lessons drawn from specific case studies

- **The Genome Research Programme GEN-AU (Austria)**
 - *A sound impact evaluation can be triggered by an earlier evaluation.*
 - **Danish Innovation Consortium Scheme (Denmark)**
 - *Positive potential benefits for gross profit and employment only for small firms.*
 - *The counterfactual behavioural effects of non-participation not studied due to difficulties in assessment.*
 - **West of Scotland Science Park (UK)**
 - *Asking the respondents the same questions in a number of different ways to deal with drawbacks associated with asking a firm to self-report their own economic impacts.*
 - *There is more than one way to evaluate a science park.*
 - *The method could be improved by focusing on the full range of measures.*
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Overview of innovation performance trends in Poland

| Indicator | 2000 | 2009 | 2010 |
|---|----------------|---------|-------|
| Gross domestic expenditure on R&D in million PLN | 4796 | 9070 | 10416 |
| Gross domestic expenditure in GDP in % | 0.64 | 0.68 | 0.74 |
| Current expenditure on basic research in % | 38.5 | 38.4 | 39.7 |
| Expenditures on R&D from the State budget in % | 64.8 (2001) | 60.4 | 60.9 |
| Innovation expenditures in the manufacturing sector in million PLN | 12234,7 | 21405,5 | 22379 |
| Share of R&D investments in total innovation expenditures in the manufacturing sector in % | 12.8 | 9.9 | 14.1 |
| Share of expenditures on innovation activity in enterprises employing more than 499 in total innovation expenditures in the manufacturing sector in % | 57.9 | 64.7 | 65 |

- *Example of the largest beneficiary of the SF interventions as a link to an earlier observation about long time lags and difficulties to quantify.*
- *Quite substantial influx the SF for the R&DI activities mainly the POIG. Yet it is to be seen which effect will low % of payments to the beneficiaries (39.25% as of 7 January 2013) have on longer-term and more structural indicators.*
- *FDI still play an important role.*

Regional Innovation Monitor - 2012



- Non-policy factors play an important role in explaining the innovation performance of regions, but **effective policies can make an important difference.** More favourably evaluated measures can be found in better performing regions.
- Out of 1081 regional innovation policy support measures, 218 have been evaluated, i.e. roughly 20%. However, even in “world-class performing regions” where good evaluation and valid monitoring are common practice, there is still room for improvement.
- Policy learning should include **an improved understanding of the prerequisites**, such as for example governance aspects.

Conclusions

- **Difficult but not impossible.** Although research and innovation cannot be evaluated in the form of a pure economic impact assessment, all public programmes should be subject to rigorous value for money evaluation.
- **Evaluation needs to offer a useful starting point for reviewing future directions.** Look seriously at past programmes and crystalise learnings to future programmes.
- **Policies influence the innovation performance.** Yet there is still a room for improvement in the availability and quality of evidence-based assessments.
- **More than one way to evaluate innovation.** Use the Guide which offers help on the choice of methodologies and approaches available and used in practice.

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**<<Soon launch of the Regional Innovation Monitor Plus
(2013-2014) activities >>**